

Category 1 (Foundational/Regional) Project Final Report

Report Completion Date: July 7, 2020

Section 1: Project Information

Project Information	
Control #: Title:	1.4.29
Project Title:	Future Electric Utility Regulation
Project PI Name and Lab Affiliation: Project Co-PI (plus-one) and Lab Affiliation:	Pete Cappers (LBNL) Juliana Williams (NREL - plus one)
DOE Project Manager(s):	Joe Paladino/Elaine Ulrich
Period of Performance:	2/4/2016 – 6/30/2020
Date Closed:	

Section 2: Project Assessment and Checklist

Project Assessment and Checklist	Y/N	Confirmation Date	Comments
Have all quarterly reports been submitted?	Y		
Have all milestones have been delivered?	Y		
Are all products finalized (e.g. technical reports, journal articles)?	N		Several reports are still under DOE review
Have all project products been finalized and presented/submitted to DOE Project Manager(s) and/or GMI Leadership?	Y		
Have all potential sensitivities been identified and addressed with DOE Project Managers and/or GMI Leadership?	Y		
Has the project team received feedback from Project Stakeholders (e.g. advisory group)?	N/A		
Are there any open or pending costs?	N		

Section 3: Outcomes, Deliverables, Publications

Provide the following:

**In addition to titles, provide links to any websites or other repositories where deliverables and/or other information will be available after the project has been completed*

**Publications available for public release, URLs, etc. listed here should be uploaded to GMLC Open Point*

1. List of Outcomes:

- a. Provided technical assistance directly to 13 state PUCs TA and indirectly to 20 states through regional workshops, many of which resulted in some form of a publicly available deliverable or publication;

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- b. Analyzed the financial impacts of DERs on ratepayers and utilities; and
 - c. Wrote 7 multi-perspective reports on evolving issues in utility regulation and ratemaking, utility business models and electricity markets, with webcast and conference presentations
- 2. List of Deliverables (4):**
- a. Pratt, A. (2018) *Integrated Energy System Model (IESM)*. July. National Renewable Energy Laboratory, Golden, CO.
 - b. Flores-Espino, F. (2016) *Rooftop PV Financial Performance in Puerto Rico*. October. National Renewable Energy Laboratory, Golden, CO.
 - c. Elgqvist, E. (2017) *Connecticut Green Bank Residential Solar PV + Energy Storage Analysis*. December. National Renewable Energy Laboratory, Golden, CO.
 - d. Kihm, S., Calice, M., Cappers, P. (2019). *Stakeholder Value and Regulatory Policy: Training Program for the Hawaii Public Utilities Commission*. August 13-14. Honolulu, HI.
- 3. List of Publications (19):**
- a. Kahrl, F. (Under DOE Review). *All-Source Competitive Solicitations: State and Electric Utility Practices*. Ed. Schwartz, Lisa C. FEUR Report No. 13.
 - b. Xcel Energy, Chriss, S., Bird, L., Barua, P., Bishop, H., Bonugli, C., and Schwartz, L.C. (Under DOE Review). *Renewable Energy Options for Large Utility Customers*. FEUR Report No. 12.
 - c. Williams, J., Koebrich, S., Hurlbut, D., McLaren, J. (Under DOE Review). *Program Design Considerations for Managing Electric Vehicle Charging Loads: A Colorado Case Study*. National Renewable Energy Laboratory, Golden, CO.
 - d. Cappers, P., Satchwell, A., Dupuy, M., Linvill, C. (Under DOE Review). *Electric Utility Decoupling Mechanisms in the United States: Rate Impacts in the Context of Growth of Distributed Energy Resources*. Lawrence Berkeley National Laboratory, Berkeley, CA.
 - e. Munankarmi, P., Wu, H., Pratt, A., Lunacek, M., Balamurugan, S.P., Spitsen, P. (Under DOE Review). *Home Energy Management System for Price-Responsive Operation for Consumer Technologies Under an Export Rate*. National Renewable Energy Laboratory, Golden, CO.
 - f. Brooks, C., P. Cappers, A. Satchwell (Under DOE Review). *Expanding the Scope of Commercial Opportunities for Investor-Owned Electric Utilities*. Berkeley, CA: Lawrence Berkeley National Laboratory.
 - g. [Elliot, R., National Rural Electric Cooperative Association, Organization of MISO States, Aaronson, S., Edison Electric Institute, and National Association of State Utility Consumer Advocates \(2019\). *Utility Investments in Resilience of Electricity Systems*. Ed. Schwartz, Lisa C. FEUR Report No. 11.](#)
 - h. [Homer, J., and Orrell, A. \(2019\) *Distributed Generation Cost-Benefit and Ratemaking Considerations for Idaho*. Prepared for the Idaho Public Utilities](#)

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- [Commission. Pacific Northwest National Laboratory, Richland, WA. September. PNNL-28285.](#)
- i. [Jones, P.B., Levy, J., Bosco, J., Howat, J., Van Alst, J.W. \(2018\). *The Future of Transportation Electrification: Utility, Industry and Consumer Perspectives*. Ed. Schwartz, Lisa C. Vol. FEUR Report No. 10.](#)
 - j. [Satchwell, A. and Cappers, P. \(2018\) Customer Bill Impacts of Energy Efficiency and Net-Metered Photovoltaic System Investments. *Utilities Policy*. 50: 144-152.](#)
 - k. [Migden-Ostrander, J., Shenot, J., Kadoch, C., Dupuy, M., and Linvill, C. \(2018\) *Enabling Third-Party Aggregation of Distributed Energy Resources*. Prepared for the Public Service Commission of Arkansas. Regulatory Assistance Project, Montpelier, VT. February.](#)
 - l. [Migden-Ostrander, J., Littell, D., Shipley, J., Kadoch, C., and Sliger, J. \(2018\). *Recommendations for Ohio's Power Forward Inquiry*. Prepared for the Public Utilities Commission of Ohio. Regulatory Assistance Project, Montpelier, VT. February.](#)
 - m. [Satchwell, A. \(2017\) "What will Electric Utility Regulation and Business Models Look Like in 2030?" Presented at Legislative Energy Horizon Institute in Richland, WA. July 11.](#)
 - n. [Satchwell, A., Cappers, P. and Goldman, C. \(2017\) *Financial Impacts of a Combined Energy Efficiency and Net-Metered PV Portfolio on a Prototypical Northeast Utility*. Lawrence Berkeley National Laboratory, Berkeley, CA. April. LBNL-1007280.](#)
 - o. [Blansfield, J., Wood, L., Katofsky, R., Stafford, B., Waggoner, D., and National Association of State Utility Consumer Advocates \(2017\). *Value-Added Electricity Services: New Roles for Utilities and Third-Party Providers*. Ed. Schwartz, Lisa C. Vol. FEUR Report No. 9. LBNL-2001073.](#)
 - p. [Kihm, S., Beecher, J., and Lehr, R. \(2017\). *Regulatory Incentives and Disincentives for Utility Investments in Grid Modernization*. Ed. Schwartz, Lisa C. Vol. FEUR Report No. 8. LBNL-2001032.](#)
 - q. [Glazer, C., Morrison, J., Breakman, P., Clements, A. and National Association of State Utility Consumer Advocates \(2017\). *The Future of Centrally-Organized Wholesale Electricity Markets*. Ed. Schwartz, Lisa C. Vol. FEUR Report No. 7. LBNL-1007226.](#)
 - r. [Homer, J. \(2017\) *Market Track Considerations for Hawaii PUC*. Prepared for the Hawaii Public Utilities Commission. Pacific Northwest National Laboratory, Richland, WA. September. PNNL-26822.](#)
 - s. [Sedano, R. \(2016\) "A Decoupling Foundation: Montana Public Service Commission Workshop on Decoupling" Presented at Montana Public Service Commission Workshop on Decoupling. Regulatory Assistance Project, Montpelier, VT. October 28.](#)
4. **List of Awards or Recognition:** N/A
 5. **List any ROIs – Software, Intellectual Property, Licensing, Patents, Etc.** N/A

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Section 4: Final Costing

Each Lab Financial POC Completes Final Costing of GMLC Projects for their lab. PIs, Lab Leads will need to assist but not required to report financials with this final report.

Section 5: Final Thoughts/Comments

Final Thoughts	Comments
Lessons Learned	This is a very important topic that regulators often have limited experience with and so greatly benefit from having this kind of tailored technical assistance.
Opportunities for Improvement	Create more structured opportunities for cross-lab collaboration on TA activities; Improve communication plan so that opportunities for TA are widely publicized; Minimize the barriers to requesting TA.
Future Projects: Ideas for future work? Possible next steps and research direction?	More TA may be needed in the near future on the following topics: valuation; net metering successor tariffs; revenue adjustment mechanisms; performance incentive mechanisms; and expanded commercial opportunities.
Other:	